

The effects of the inclusion of sexual orientation on the transmission dynamics and vaccination strategies in mathematical transmission models of sexually transmitted infection.

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In this work, the effects of the addition of three sexual orientation classes, heterosexual, homosexual and bisexual, on the transmission of sexually transmitted infections and their vaccination strategies was investigated. This work extends previous work in the field [1] with sexual orientation modelled in both sex classes of the population and the inclusion of sexual behaviour such as risk classes. Results show the bisexual population can form a bridge between the homosexual and heterosexual population. It was shown that the effects of this bridge on the transmission of the infection and the vaccination strategies are dependent on the transmission dynamics of the infection, the proportion of the population engaging in bisexual activity, the risk behaviour of the bisexual population, as well as their sexual preference in partner selection. This indicates that vaccination strategies targeting only a specific sex, such as those investigated with human papillomavirus (HPV), could underperform in certain populations or sub-populations and that further study is required on the social behaviour of the population and its effect on the transmission of infection in regards to the study of vaccination or prevention strategies.

References

- [1] J.A. Bogaards , M.Kretzschmar, M. Xiridou, C. J. L. M. Meijer, J. Berkhof, J. Wallinga *Sex-Specific Immunization for Sexually Transmitted Infections Such as Human Papillomavirus: Insights from Mathematical Models*, PLoS Med , vol 8, **12** , 1-11, 2011